

Geologic Site of the Month  
June, 2008

***Porter Point Preserve, Boothbay***



43 52' 33.54" N, 69 41' 0.48" W

Text by  
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## Introduction

Located on the southern end of Barters Island in Boothbay, the Porter Point Preserve of the [Boothbay Region Land Trust](#) provides welcome relief from the commercialized center of town. Visitors here are treated to well-maintained forest trails, pleasing southern views of the Sheepscot River, and some interesting bedrock ledges.



Photo by Robert Marvinn



Cape Elizabeth Formation

The western half of the island is underlain with high-grade metamorphic rocks of the Cape Elizabeth Formation, which are generally medium gray gneisses (banded metamorphic rocks) rich in quartz and feldspar with thin black mica bands.



Photo by Robert Marvinn

**Figure 1.** Dark mica-rich bands in the gneiss of the Cape Elizabeth Formation grade into coarse-grained quartz-feldspar migmatite on the right side of the image.

### Migmatites

In this area, the rocks are highly migmatized, meaning that they were heated to such a great degree that some of the rocks melted in place. The resulting quartz-feldspar-rich migmatite rock often grades into the gneiss from which it was derived. Often at this locality, the banding of the gneiss and migmatite is contorted in great swirls.



Photo by Robert Marvinn

Maine Geological Survey

**Figure 2.** Swirled banding in the gneiss and migmatite. Thin layers of migmatite are roughly parallel to the banding in the gneiss. In the lower portion of the image, a pegmatite dike about ½ meter thick cuts across the gneiss and migmatite.





### Pegmatites

Younger pegmatites, consisting of very coarse quartz-feldspar-mica rock, cut across the layering in the gneiss and migmatite. The sharp angle of the contact and the sharpness of the contact itself help distinguish this pegmatite from similar looking migmatite.



Photo by Robert Marvinn

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**Figure 3.** In this image, well-developed banding in gneiss of the Cape Elizabeth Formation on the left and right sides is cut at a sharp angle by a younger pegmatite across the center.



Folds

Photos by Robert Marvinney



**Figure 4.** This image of a vertical rock face shows an early fold in the banding of the gneiss, wherein the banding is nearly horizontal in the upper and lower limbs of the fold. Such sub-horizontal folds are rarely observed in the area.

**Figure 5.** In contrast with Figure 4, this image of another vertical rock face shows a younger upright fold in which the banding on the left and right limbs of the fold is nearly vertical. This type of fold is most commonly observed in the rocks of this region.



Amphibolite

Exposures of swirled gneiss in the area often contain blocks of other kinds of rocks.



Photo by Robert Marvinney

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**Figure 6.** Here, a block of dark amphibolite (a rock composed largely of dark colored hornblende or related minerals) is surrounded by swirled gneiss. Complicated patterns like this attest to the extreme heat and pressure that the rocks have endured.

Gabbro

Photos by Robert Marvinn

**Figure 7.** Other types of rocks are exposed at Porter Point including this gabbro. It's an igneous rock that formed from a cooling magma and contains mainly dark-colored minerals rich in iron and magnesium, plus lighter feldspar. Some of the feldspar crystals are quite large.



**Figure 8.** Close-up of a large feldspar crystal in the finer-grained gabbro of Figure 7. The large feldspars suggest that the magma that formed the gabbro first cooled slowly, allowing large feldspars to grow, and then cooled rapidly, producing the bulk of the finer-grained rock. Note quarter for scale.



### Directions

From Boothbay Harbor, travel north on Route 27; take a left at the monument in Boothbay Center onto Corey Lane. Proceed 0.3 mile. Turn right onto Barters Island Road and travel 2.2 miles, crossing two bridges. Turn left on Kimballtown Road. Proceed 0.5 mile and turn left onto a dirt road. Proceed 0.1 mile to a small parking area on your right just beyond the cemetery. Please do not block the road as it is used by other property owners.

### Additional Reading

Hussey, A.M., II, 1992, [Bedrock geology of the Westport 7.5' quadrangle, Maine](#): Maine Geological Survey, Open-File Map 92-59 (PDF, 4.4 MB).

Hussey, A.M., II, and Marvinney, R.G., 2002, [Bedrock geology of the Bath 1:100,000 quadrangle, Maine](#): Maine Geological Survey, Geologic Map 02-152 (PDF 4.9 MB).

